Amendments to the Claims:

This listing of claims will replace all prior versions and listing of claims in the application:

Listing of Claims:

1 – 72 (Canceled)

73. (Currently Amended) A system for diagnosing the quality of a reagent solution, comprising:

a reagent solution source configured to supply the reagent solution to an emissions catalyst of an internal combustion engine,

means for determining a quality value corresponding to the quality of the reagent solution,

a long run averaging filter configured to receive the quality value and produce a long run average of the quality value,

a short run averaging filter configured to receive the quality value and produc[[ing]]e a short run average of the quality value, and

a comparator configured to compare a difference between the long run average of the quality value and the short run average of the quality value to a first threshold and produce a fault value if the difference crosses the first threshold.

74. (Previously presented) The system of claim 73 further comprising:

a temperature sensor configured to produce a temperature signal indicative of a temperature of the reagent solution, and

a threshold determining circuit configured to produce the first threshold as a function of the temperature signal.

75. (Previously presented) The system of claim 73 further comprising:

a memory and,

a fault detection timer configured to activate upon receipt of the fault value and to log the fault value in the memory when the fault detection timer expires after activation thereof.

76. (Previously presented) The system of claim 75 wherein the fault detection timer has an enable input configured to receive an enable value,

and wherein the fault detection timer is configured to log the fault value in the memory only if the enable value is active and to otherwise not log the fault value in the memory.

77. (Previously presented) The system of claim 76 further comprising:

a temperature sensor configured to produce a temperature signal indicative of a temperature of the reagent solution, and

a control circuit responsive to the temperature signal to activate the enable value if the temperature of the reagent solution is above a first predefined temperature.

78. (Previously presented) The system of claim 77 further comprising a heater configured to heat the reagent solution,

wherein the control circuit is responsive to the temperature signal to deactivate the enable value and activate the heater if the temperature of the reagent solution is below the first predefined temperature.

79. (Previously presented) The system of claim 78 further comprising means for determining a level of the reagent solution within the reagent solution source, wherein the control circuit is configured to monitor the temperature signal after activating the heater and to deactivate the heater and activate the enable value if a difference between the liquid level of the reagent solution when the temperature of the reagent solution is above a second predefined temperature greater than the first predefined temperature and an expected liquid level is less than a threshold level.

80. (Previously presented) The system of claim 78 wherein the control circuit is configured to monitor the temperature signal after activating the heater and to reset a timer when the temperature of the reagent solution is above a second predefined temperature greater than the first predefined temperature, and to then deactivate the heater and activate the enable value when the timer times out.

81. (Previously presented) The system of claim 78 further comprising means for monitoring a change in concentration of the reagent solution over a predefined time period,

and wherein the control circuit is configured to monitor the temperature signal after activating the heater and to deactivate the heater and activate the enable value if

the change in concentration of the reagent solution over the predefined time period is less than a concentration threshold when the temperature of the reagent solution is above a second predefined temperature.

82. (Previously presented) The system of claim 73 wherein the comparator is configured to a compare the difference between the long run average of the quality value and the short run average of the quality value to a second threshold different from the first threshold and to produce the fault value if the difference crosses the second threshold.

83. (Previously presented) The system of claim 82 wherein a range of acceptable quality values is defined between the first and second thresholds; and wherein the comparator is configured to produce the fault value if the difference is outside the range of acceptable quality values.

84. (Previously presented) The system of claim 83 further comprising:
a temperature sensor configured to produce a temperature signal indicative of a temperature of the reagent solution, and

a threshold determining circuit configured to produce the first threshold and the second threshold each as a function of the temperature signal.

85. (Previously presented) The system of claim 84 further comprising:
a memory and,

a fault detection timer configured to activate upon receipt of the fault value and to log the fault value in the memory when the fault detection timer expires after activation thereof.

86. (Previously presented) The system of claim 85 wherein the fault detection timer has an enable input configured to receive an enable value,

and wherein the fault detection timer is configured to log the fault value in the memory only if the enable value is active and to otherwise not log the fault value in the memory.

87. (Previously presented) The system of claim 86 further comprising:

a heater configured to heat the reagent solution, and

a control circuit responsive to the temperature signal to activate the enable value if the temperature of the reagent solution is above a first predefined temperature, and to otherwise activate the heater and deactivate the enable value.

88. (Previously presented) The system of claim 87 further comprising:

means for determining a level of the reagent solution within the reagent solution source, and

means for monitoring a change in concentration of the reagent solution over a predefined time period,

wherein the control circuit is configured to monitor the temperature signal after activating the heater and to deactivate the heater and activate the enable value if at least one of the following conditions thereafter occur:

a difference between the liquid level of the reagent solution when the temperature of the reagent solution is above a second predefined temperature greater than the first predefined temperature and an expected liquid level is less than a threshold level,

a timer is reset when the temperature of the reagent solution is above the second predefined temperature and the timer thereafter times out, and

the change in concentration of the reagent solution over the predefined time period is less than a concentration threshold when the temperature of the reagent solution is above the second predefined temperature.

89. (Previously presented) The system of claim 73 further comprising:

a fault lamp; and

a control circuit responsive to the fault value to illuminate the fault lamp.

90. (Previously presented) The system of claim 73 further comprising:

a wireless transceiver; and

a control circuit responsive to the fault value to transmit the fault value to a remote receiver via the wireless transceiver.

91. (Original) The system of claim 73 further comprising:

a fuel system responsive to a fuel control signal to supply fuel to the engine; and

a control circuit responsive to the fault value to modify engine performance by modifying the fuel control signal.